

Project-Level Conformity Determination Air Quality Fine Particulate Matter (PM_{2.5})

PM_{2.5} Hot Spot Conformity Determination for the Interstate – 55 (Stevenson Expressway) Project from Interstate - 80 to Weber Road Will County, Illinois

I. Purpose of this document

The *Clean Air Act section 176(c)* requires that federally supported highway and transit project activities are consistent with state air quality goals, found in the *state implementation plan* (SIP). The process to ensure this consistency is called Transportation Conformity. Conformity to the SIP means that transportation activities will not cause new violations of the *national ambient air quality standards* (NAAQS or “standards”), worsen existing violations of the standard, or delay timely attainment of the relevant standard.

Transportation conformity is required for federal supported transportation projects in areas that have been designated by the U.S. Environmental Protection Agency (EPA) as not meeting a NAAQS. These areas are called *nonattainment areas* if they currently do not meet air quality standards or *maintenance areas* if they have previously violated air quality standards, but currently meet them and have an approved *Clean Air Act section 175A* maintenance plan.

Will County is designated as nonattainment for fine particulate matter, called PM_{2.5}¹. For PM_{2.5} project-level conformity an assessment of localized emissions impacts for certain projects is required. This localized assessment is a *hot-spot analysis*.

EPA amended the Transportation Conformity rule on March 10, 2006², requiring a hot-spot analysis as part of project-level conformity in PM_{2.5} and PM₁₀ nonattainment and maintenance areas. The PM_{2.5} and PM₁₀ hot-spot requirements in the final rule became effective April 5, 2006. The PM_{2.5} hot-spot analysis are required pursuant to *40 CFR 93.116 and 93.123(b)(1)(i)*. The PM_{2.5} hot-spot analysis was not incorporated or available for the ECAD or available through the project’s Public Hearing held December 2005. Therefore, the PM_{2.5} hot-spot analysis has been undertaken separately and is being made available for public review and comment.

II. I-55 (Stevenson Expressway) - General Project Description

The I-55 Phase I study from I-80 to Weber Road traverses the City of Joliet, Villages of Plainfield, Romeoville, Bolingbrook, Shorewood, and Channahon. The total length is approximately 13 miles. I-55 currently carries an average daily traffic of approximately

¹ USEPA: Last updated on Wednesday, March 15th, 2006; URL: <http://www.epa.gov/oar/oaqps/greenbk/>

² EPA posted the final rule on its website on March 1, 2006 and the final rule was published in the Federal Register on March 10, 2006.

68,000 vehicles per day within the project limits. I-55 traffic expects to increase to an average 85,000 vehicles per day by the year 2030. The existing typical cross-section of I-55 generally includes 4 to 6-foot left (inside) shoulders, 2-12-foot travel lanes, and 10-foot right (outside) shoulders separated by an 18-foot center grassed median within approximately 300-feet of existing right-of-way.

The improvement as proposed includes reconstructing mainline I-55 to provide 12-foot inside shoulders, three 12-foot travel lanes, and 12-foot outside shoulders separated by a 3-foot concrete median barrier. The I-55 improvements will match into the improvements currently being made at I-80 and those planned for IL 59. To accommodate this proposed cross section, all the mainline I-55 bridges will need to be widened and/or replaced. In addition, several overhead bridges will need to be replaced to accommodate the wider proposed roadway. As part of the overhead bridge replacements, the US Route 52 Bridge over I-55 is proposed to be replaced and offers the opportunity for IDOT to evaluate and improve interchange operations. This is the proposed plan for the ultimate improvement.

However, the IDOT is evaluating a Staged Implementation Plan to provide I-55 improvements over several years. **Step One** of the Staged Implementation Plan includes widening I-55 to accommodate an additional lane in each direction separated by a concrete Jersey barrier. This widening would occur within the existing median and would address the immediate safety as well as operational concerns of the roadway. The proposed cross section would be similar to that recently constructed on I-55 just north of Weber Road. Only minimal work to accommodate the travel lane configurations is anticipated to occur at the existing interchange ramps. However, the Staged Improvement plan does not preclude their construction at a future date. Additional right-of-way is not proposed for acquisition as part of the Staged Improvement plan.

Step Two generally involves improving or replacing all the overhead bridges as necessary to accommodate a future widening of I-55.

Step Three generally involves reconstructing the mainline to provide standard 12-foot inside and outside shoulders.

III. Background

What is Particulate Matter (PM)?

Airborne particulate matter (PM) consists of many different substances suspended in air in the form of particles (solids or liquid droplets) that vary widely in size. The particle mix in most U.S. cities is dominated by fine particles (less than 2.5 micrometers in diameter) generated by combustion sources, with smaller amounts of coarse dust (between 2.5 and 10 micrometers in diameter). Particles less than 10 micrometers in diameter include both fine and coarse dust particles. These particles pose the greatest health concern because they can pass through the nose and throat and get into the lungs. Particles larger than 10 micrometers in diameter that suspend in the air are referred to as total suspended particulates (TSP). These larger particles can cause irritation to the eyes, nose and throat in some people, but they are not likely to cause more serious problems since they do not get down into the lungs.

Motor vehicles (*i.e.*, cars, trucks, and buses) emit direct PM from their tailpipes, as well as from normal brake and tire wear. In addition, vehicles cause dust from paved and unpaved

roads to be re-entrained, or re-suspended, in the atmosphere. In addition, highway and transit project construction may cause dust. Finally, gases in vehicle exhaust may react in the atmosphere to form PM. Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. PM_{2.5}, or fine particulate matter, refers to particles that are 2.5 micrometers in diameter or less. (*Note: A human hair is about 70 micrometers in diameter and a grain of sand is about 90 micrometers in diameter*). The National Ambient Air Quality Standards (NAAQS) for fine particulate matter include an annual standard (15.0 micrograms per cubic meter (ug/m³)) and a 24-hour standard (65 ug/m³). The annual standard is based on a 3-year average of annual mean PM_{2.5} concentrations; the 24-hour standard is based on a 3-year average of the 98th percentile of 24-hour concentrations.

Statutory Requirements for PM Hotspot Analyses

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: “PM_{2.5} and PM₁₀ Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New PM_{2.5} and Existing PM₁₀ National Ambient Air Quality Standards” (71 FR 12468). These rule amendments require the assessment of localized air quality impacts of Federally-funded or approved transportation projects in PM₁₀ and PM_{2.5} nonattainment and maintenance areas deemed to be *projects of air quality concern*.³ This assessment of localized impacts (*i.e.*, “hot-spot analysis”) examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act conformity requirements to support State and local air quality goals. If a project still requires a Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) approval or authorization, a project-level conformity determination will be required prior to the first such action on or after April 5, 2006, even if the project has already completed the National Environmental Policy Act (NEPA) process. After project-level conformity is determined for a project, a new conformity determination is only required under the scenarios discussed in 40 CFR 93.104(d).⁴

Qualitative hot-spot analysis is required for these projects before EPA releases its future quantitative modeling guidance and announces that quantitative PM_{2.5} hot-spot analyses are required under 40 CFR §93.123(b)(4). EPA requires hot-spot findings to be based on directly emitted PM_{2.5}, since secondary particles take several hours to form in the atmosphere giving emissions time to disperse beyond the immediate area of concern. The Conformity Rule requires PM_{2.5} hot-spot analyses to include road dust emissions only if such emissions have been found significant by EPA or the state air agency prior to the PM_{2.5} SIP or as part of an adequate PM_{2.5} SIP motor vehicle emissions budget (40 CFR §93.102(b)(3)). Emissions resulting from construction of the project are not required to be considered in the hot-spot analysis if such emissions are considered temporary according to 40 CFR §93.123(c)(5).

The PM_{2.5} and PM₁₀ hot-spot requirements in the final rule became effective April 5, 2006. A qualitative PM_{2.5} and PM₁₀ hot-spot analysis that meets the final rule's requirements must be

³ Criteria for identifying *projects of air quality concern* is described in 40 CFR 93.123(b)(1), as amended.

⁴ 40 CFR 93.104(d) states, “FHWA/FTA projects must be found to conform before they are adopted, accepted, approved, or funded. Conformity must be redetermined for any FHWA/FTA project if one of the following occurs: a significant change in the project's design concept and scope; three years elapse since the most recent major step to advance the project; or initiation of a supplemental environmental document for air quality purposes. Major steps include NEPA process completion; start of final design; acquisition of a significant portion of the right-of-way; and, construction (including Federal approval of plans, specifications and estimates).”

completed for project-level determinations for projects of air quality concern completed on or after April 5, 2006.

IV. Regional Conformity Determination

Section 176(c) of the Clean Air Act and the federal conformity rule require that transportation plans and programs conform to applicable state air quality implementation plans (SIPs) and Section 174 and 176(c) and (d) of the Clean Air Act (42 U.S.C. 7504, 7506(c) and (d)). The project was included in the FY 2005 – 2009 Transportation Improvement Program (TIP), endorsed by the Policy Committee of the Chicago Area Transportation Study (CATS), the Metropolitan Planning Organization (MPO) for the region in which the project is located. Projects in the TIP were considered to be consistent with the 2030 Regional Transportation Plan (RTP) endorsed by CATS. On July 11, 2005, the FHWA and the FTA determined that the TIP conformed to the State Implementation Plan (SIP). In addition, the FHWA and the FTA made a PM_{2.5} conformity determination on February 15, 2006. These findings were in accordance with *40 CFR Part 93*, “Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans, Programs, and Projects Funded or Approved under *Title 23 USC* or the Federal Transit Act.”

The project’s design concept and scope are consistent with the project information used for the TIP conformity analysis. Therefore, this project conforms to the existing SIP and the transportation-related requirements of the 1990 Clean Air Act Amendments. This project’s TIP number is # 12-97-0027. The I-55 project was included in the regional emissions analysis and there have been no significant changes in the project’s design concept or scope, as used in the conformity analyses. Therefore, the project comes from a conforming plan and program in accordance with *40 CFR 93.115*.

V. PM Hot Spot Analysis

According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until EPA releases modeling guidance in the Federal Register. However, a qualitative hot spot analysis is still required. For this Illinois Department of Transportation I-55 (Stevenson Expressway) project, a qualitative project-level PM_{2.5} hot-spot assessment was conducted in order to assess whether the project will cause or contribute to any new localized PM_{2.5} violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the PM_{2.5} NAAQS.

Existing Conditions

The affected area for the purposes of this analysis is the I-55 area between Interstate 80 and Weber Road as described in Section II of this document. Additional details are further elaborated in the “Environmental Class of Action Determination (ECAD) Document, Interstate 55 Interstate 80 to Weber Road, Will County, Illinois”, and the “Combined Location Design Report, Interstate 55 Interstate 80 to Weber Road, Will County, Illinois” and their associated documentation. This section includes a discussion of currently available information on existing conditions related to air quality and traffic conditions within and near the I-55 project study area.

Air Quality – Monitors

Illinois EPA - In the “Illinois Annual Air Quality Report 2004”⁵ there was one (1) PM_{2.5} monitoring site in Will County nonattainment area and one (1) PM_{2.5} monitoring station nearby in adjacent DuPage County. Air quality monitoring information for PM_{2.5} levels were obtained from these two (2) closest sites to the I-55 project area (Joliet – Pershing Elementary School at Midland and Campbell Streets; Naperville – City Hall at 400 South Eagle Street). The data results is published in the “Illinois Annual Air Quality Report, 2004” issued by the Illinois EPA. The report identifies no violations in 2004 of the air quality standards for particulate matter PM_{2.5}. **Attachment 1 - IEPA Standard Assessment** provides 3-Year Average data from the Illinois EPA monitoring stations Joliet, and Naperville for the PM_{2.5} 24-hour Standard Assessment (98th Percentile Value) and PM_{2.5} Annual Standard Assessment. There were no violations 2002 through 2004.

Statewide Trends - The following identifies the recent trends throughout the State including Will, County for which data was available in the “Illinois Annual Air Quality Report, 2004”. For the State, in terms of air quality during 2004, there were seven days (all for PM_{2.5}) when air quality in some part of Illinois was considered “Unhealthy for Sensitive Groups” which is a significant decrease over that from 2003 with 19 days. Throughout the state monitoring was conducted at 37 stations for PM_{2.5}. Valid annual averages (meeting minimum statistical selection criteria⁶) were obtained for 36 of the 37 sites. Six (6) stations recorded averages above 15.0 ug/m³, the level of the annual standard compared with 9 stations in 2003 and 14 stations in 2002. The Statewide average of annual averages was 12.5 ug/m³ in 2004 compared with 14.1 ug/m³ in 2003 and 14.9 ug/m³ in 2002. The trend of the statewide annual averages for PM_{2.5} for the period 2000-2004 was downward. There were no exceedances of the 24-hour standard of 65 ug/m³ in 2004. The Statewide peak in 2004 of 54.3 ug/m³ was recorded in Schiller Park in the northern part of Cook County. The Statewide average of the 98th percentile of 24-hour averages was 30.9 ug/m³ in 2004 compared with 34.1 ug/m³ in 2003 and 33.9 ug/m³ in 2002.

Transportation and Traffic Conditions⁷

This project is included in the FY 2005-2009 Transportation Improvement Program (TIP) endorsed by the Policy Committee of the Chicago Area Transportation Study (CATS), the Metropolitan Planning Organization (MPO) for the region in which the project is located. This project is also a part of the *2030 Regional Transportation Plan* (RTP) for Northeastern Illinois endorsed by CATS. All six of the municipalities adjacent to I-55 through the project area and Will County have indicated their support for this project.

Existing Traffic

Average daily traffic (ADT) along I-55 currently averages approximately 68,000 vehicles per day (vpd). Recent growth in traffic has coincided with the growth in population and employment in the surrounding areas.

Future Traffic

⁵ Information extracted from the “Illinois Annual Air Quality Report 2004”, Illinois Environmental Protection Agency, Bureau of Air 1021 North Grand Avenue, East, P.O. Box 19276, Springfield, Illinois, 62794-9276; December 2005

⁶ Ibid. “Appendix B Air Quality Data Interpretation”, page 45

⁷ “Combined Location Design Report, Interstate 55 Interstate 80 to Weber Road, Will County, Illinois”; Illinois Department of Transportation, 2006

CATS provided traffic forecasts for the year 2030. **Table 1** shows the existing and projected build traffic volumes expected.

TABLE 1
I-55 (Stevenson Expressway)
from I-80 to Weber Road

| | 2002 | 2010 | 2020 | 2030 |
|--|-----------------|--------------|--------------|--------------|
| | Existing | Build | Build | Build |
| Average ADT | 68,000 | 72,000 | 79,000 | 85,000 |
| Daily VMT* Using Segment Length | 1,277,000 | 1,356,000 | 1,478,000 | 1,598,000 |
| Daily Truck VMT Using Segment Length | 220,726 | 233,850 | 254,437 | 274,537 |
| Truck % Prorated by Segment Length and ADT | 17% | 17% | 17% | 17% |

* Vehicle miles of travel

Build and Natural Environment⁸

Land use adjacent to the project area consists of a mixture of actively farmed agricultural, residential subdivisions, commercial retail strip-type and the Louis Joliet regional shopping mall, and scattered industrial uses. There are also several public recreational areas fronting the I-55 right-of-way. These include Hammel Woods, Van Horn Woods, Lake Renwick Preserve, and Four Seasons Avery Preserve.

Communities, in and surrounding the project area, have grown rapidly in recent years, and this growth is projected to continue. Traffic volumes have doubled and, in some cases, tripled along sections of I-55 since the mid-1980s. As a result, congestion and travel delays are common, particularly during the morning and evening rush hours. Traffic forecasts for the year 2030 show that traffic volumes will continue to increase, which will lead to even more congestion.

Future Conditions

In general, air quality trends for the criteria pollutants are continuing to show downward or stable trends well below the level of the NAAQS over the ten-year period, 1995 to 2004.⁹

According to EPA, the 2007 Heavy-duty engine standards will result in the introduction of new, highly effective control technologies for heavy-duty engines, beginning in 2007. Particulate matter emission levels is expected to be 90 percent lower on a per vehicle basis than 2000 standards levels due to the 2007 diesel engine and fuel program.¹⁰

Analysis and Considerations

Air quality information supplied by the IEPA found that the monitoring stations in the project's vicinity had violations in 2000, 2001 and for the Annual Average 2000-2002 as

⁸ "Environmental Class of Action Determination Document (ECAD), Interstate 55 Interstate 80 to Weber Road, Will County, Illinois"; Illinois Department of Transportation, 2006

⁹ *Op. cit.*, Illinois Annual Air Quality Report 2004", pages ix and 10

¹⁰ "Fine Particles (PM2.5) Standards Air Quality Conformity Assessment", December 21, 2005, National Capital Regional Transportation Planning Board, Metropolitan Washington Council of Governments

identified in **Attachment 1 - IEPA Standard Assessment**.¹¹ This information also showed that PM_{2.5} short-term trends for the monitoring stations in the project's vicinity showed a downward trend.¹² In addition, the Particulate Matter (PM) emissions trend from existing sources (categories), where fuel combustion is the second highest contributor, throughout the State of Illinois continues to show a future decreasing trend from 1995 to 2004.¹³

The hot-spot analysis has not considered PM_{2.5} road dust emissions, since USEPA or the Illinois EPA has not made a finding of significance.

The meteorology along the I-55 (Stevenson Expressway) project and the surrounding area is variable, since the wind does vary during the day. There is often wind that acts to disperse PM_{2.5} emissions in easterly and westerly directions along the I-55 (Stevenson Expressway) general north-south configuration in this portion of Will County. Temperature, humidity, and rainfall do not seem to influence nor been shown to influence the level of PM_{2.5} emissions along or surrounding the I-55 (Stevenson Expressway) project area.

CATS estimated the overall direct PM_{2.5} vehicle emissions for projects based on overall VMT and diesel VMT data for the project year 2002 (the baseline year), 2010, 2020 and 2030. **Attachment 2 - PM_{2.5} Hot Spot Analysis** provides the analysis and information that applies to the direct PM_{2.5} emissions factors to VMT from CATS transportation model that was developed for the hot spot PM_{2.5} conformity determination. The analysis was sent to the USEPA and other members of the interagency consultation team for review, and comments from the team were incorporated into the PM_{2.5} Hot Spot Analysis titled, "I-55 STEVENSON EXPY FROM WEBER RD (WILL/BOLINGBROOK) TO I_80 (WILL/CHANNAHON) – TIP ID 12-97-0027". The "Hot Spot Analysis Summary Results" below shows a decrease in the Annual Fine Particulate Matter from the existing year 2002 to the design year 2030.

Hot Spot Analysis Summary Results

**I- 55 STEVENSON EXPY FROM WEBER RD (WILL/BOLINGBROOK) TO I- 80
(WILL/CHANNAHON) - TIP ID 12-97-0027**

Total Emissions

| Year | Annual Fine Particulate Matter | | |
|------|--------------------------------|------------------------|---------------|
| | VMT | Global Rate (gm/mi) | Tons |
| 2002 | 363,876,932 | 0.0474608 | 19.037 |
| 2010 | 385,281,424 | 0.0392525 | 16.670 |
| 2020 | 423,870,181 | 0.0182932 | 8.547 |
| 2030 | 454,846,205 | 0.0159466 | 7.995 |

Notes

2002 Annual VMT is Daily VMT times 350.838, the ratio of annual to daily VMT for 2010 and 2030

2002 Global emissions rate is from PM_{2.5} conformity analysis

2002 emissions are Global Rate times applicable VMT

¹¹ *Op. cit.*, Illinois Annual Air Quality Report 2004", pages 51 and 57

¹² *Ibid.* pages 54 and 58.

¹³ *Ibid.* pages 25.

VI. Conclusion

Based on the analysis and monitoring data along I-55, it is determined that the I-55 project met all the project level conformity requirements, and that I-55 project will not cause or contribute to a new violation of the PM_{2.5} NAAQS, or increase the frequency or severity of a violation. Therefore, the project meets the conformity hot-spot requirements in *40 CFR 93.116 and 93.123* for PM_{2.5}.

ATTACHMENT 1

IEPA Standard Assessment
 PM_{2.5} Air Quality Monitoring Stations
 I-55 (Stevenson Expressway) Project
 I-80 to Weber Road; Will County, Illinois

PM_{2.5} 24-hour Standard Assessment 98th Percentile Value Violation is 3-Year Average > 65 ug/m³

| Site | Years | | | | | Average 2000-2002 | Average 2001-2003 | Average 2002-2004 |
|----------------|-------|------|------|------|------|----------------------|----------------------|----------------------|
| | 2000 | 2001 | 2002 | 2003 | 2004 | | | |
| Naperville | 34.1 | 36.8 | 34.4 | 34.0 | 31.9 | 35.1 | 35.1 | 33.4 |
| Joliet | 30.8 | 40.1 | 33.7 | 30.8 | 29.1 | 34.9 | 34.9 | 31.2 |
| | | | | | | | | |
| Average | 32.5 | 38.5 | 34.1 | 32.4 | 30.5 | | | |

| | |
|--|-------------|
| | < 30.5 |
| | 30.5 - 40.4 |
| | 40.5 - 65.4 |
| | > 65.5 |

PM_{2.5} Annual Standard Assessment Violation is a 3-Year Average > 15 ug/m³

| Site | Years | | | | | Average 2000-2002 | Average 2001-2003 | Average 2002-2004 |
|------------|-------|------|------|------|------|----------------------|----------------------|----------------------|
| | 2000 | 2001 | 2002 | 2003 | 2004 | | | |
| Naperville | 15.3 | 15.5 | 14.7 | 13.1 | 12.7 | 15.2 | 14.4 | 13.5 |
| Joliet | 16.0 | 16.1 | 14.4 | 13.8 | 11.9 | 15.5 | 14.7 | 13.3 |

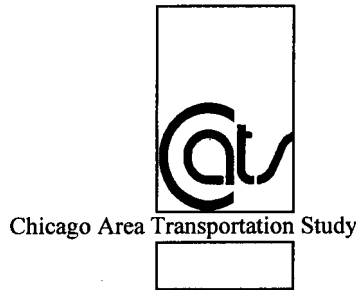
| | |
|--|-------------|
| | <= 13.0 |
| | 13.1 - 15.0 |
| | 15.1 - 17.0 |
| | 17.1 - 19.9 |
| | >= 20.0 |

ATTACHMENT 2

PM2.5 Hot Spot Analysis Method

for

**• I-55 STEVENSON EXPY FROM WEBER RD
(WILL/BOLINGBROOK) TO I-80 (WILL/CHANNAHON)
TIP ID 12-97-0027**



To: File

From: Ross Patronskey, Chief of the CMAQ Program

Date: April 26, 2006

Subject: PM_{2.5} Hot Spot Analysis Method for :

- I-55 STEVENSON EXPY FROM WEBER RD (WILL/BOLING-BROOK) TO I-80 (WILL/CHANNAHON) - TIP ID 12-97-0027

Background

The subject project was analyzed for direct PM_{2.5} emissions following a determination that it qualified as a "project of air quality concern."

Following discussion at the April 17, 2006 consultation meeting, the approach to this hot spot analysis is to estimate project-level emissions for the baseline and analysis years, and to evaluate the trends in these emissions against monitoring data from nearby sites.

CATS' responsibility is to estimate overall direct PM_{2.5} emissions for the project based on overall VMT and diesel VMT data for the project in 2002 (the baseline year), 2010, 2020 and 2030. These results will be supplied to the project implementer for incorporation into the hot spot analysis.

Method

Spreadsheets that apply direct PM_{2.5} emissions factors to VMT from CATS' transportation model were developed for the supplemental PM_{2.5} conformity determination approved by the CATS Policy Committee in October, 2005. The assumptions and parameters for the MOBILE6.2 runs used to generate the emissions factors are documented in Chapter 8 of Appendix B of the documentation for that conformity determination.

These spreadsheets were adapted for hot spot analysis by scaling the daily VMT output from the transportation model to equal the project daily VMT supplied by the implementer. Since the transportation model VMT are provided by facility type, speed and vehicle type, the VMT scaling factors are computed by facility type, to match the VMT by facility type provided by the implementer. For the project analyzed, all VMT was assigned to the freeway facility type.

In addition, the VMT by vehicle type was rescaled to match the percentage of diesel VMT supplied by the implementer. This was accomplished by computing the ratio of percent diesel VMT for the project to the percent diesel VMT for the facility type. The ratio was greater than one, increasing the diesel VMT for emissions calculations. The increase in diesel VMT was offset by a comparable ratio for gasoline VMT (percent gasoline VMT for the project to the percent gasoline VMT for the facility type), which reduced the gasoline VMT.

The rescaled daily VMT values were then extended to the full year and multiplied by the applicable direct PM_{2.5} emission rates. This method is described in Chapter 8 of Appendix B of the conformity documentation.

The IEPA analysis for the baseline year (2002) was created in a different manner than the conformity analysis for the three scenario years (2010, 2020, and 2030). As a result, the 2002 project data cannot be directly applied to PM_{2.5} emission rates from the conformity analysis.

As a surrogate approach, a “global” emissions factor was used. This factor is total direct PM_{2.5} emissions for 2002 divided by total VMT for 2002. Project emissions are then simply equal to the global factor times project VMT. To scale the daily VMT supplied by the implementer to an annual value, the ratios of annual VMT to daily VMT from 2010 and 2030 were averaged and multiplied by the 2002 daily VMT (2020 was not used because it is a leap year). Since the overall diesel percentage for the region (about 6.25% of VMT) is so much less than the diesel percentage on the projects (15% and 17% of project VMT), the global factor understates the emissions on the project for 2002, thus making the baseline estimate conservative.

Results

The results are presented in the attached summary tables. In addition, a summary input and results page from each scenario year is included. These document the VMT and percentage of diesel VMT data used in the analysis.

Hot Spot Analysis Summary Results

I- 55 STEVENSON EXPY FROM WEBER RD (WILL/BOLINGBROOK) TO I- 80
(WILL/CHANNAHON) - TIP ID 12-97-0027

Total Emissions

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Notes

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Hot Spot Analysis Summary Results

Project Identification: I- 55 STEVENSON EXPY FROM WEBER RD (WILL/BOLINGBROOK) TO I- 80 (WILL/CHANNAHON) - TIP ID 12-97-0027

EMME/2 scenario: EMME/2 Module: 3.14 Date: 05-06-23 07:56 User: E170/CATS.....cmh Page:84775
Project: c05a conformity (from Busch Parkway supplement)

Mobile6 input

File PM10J-M
Year 2010
I&M PM 2.5 rates are same for I/M & non-I/M

Diesel VMT factors

| | expressway | arterial | local | ramp |
|-------------------------|------------|----------|--------|--------|
| Baseline percent gas | 88.28% | 95.05% | 97.35% | 92.30% |
| Baseline percent diesel | 11.72% | 4.95% | 2.65% | 7.70% |
| Project percent gas | 83.00% | 0.00% | 0.00% | 0.00% |
| Project percent diesel | 17.00% | 0.00% | 0.00% | 0.00% |

VMT consistency check

| source | value | % of baseline |
|-----------------------------|-------------|---------------|
| EMME/2 grand total: | 179,198,592 | 100.0000% |
| Total at 28-vehicle split | 179,198,606 | 100.0000% |
| Implementer VMT (daily): | 1,098,000 | 100.0000% |
| VMT after diesel adjustment | 1,098,000 | 100.0000% |
| Annual Total Project VMT: | 385,281,424 | n/a |

Total Emissions

| Facility | Fine Particulate Matter (annual) | | |
|--------------------------------|----------------------------------|-----------|-------|
| | Grams | Kilograms | Tons |
| freeway | 15,123,242 | 15,123 | 16.67 |
| arterial | 0 | 0 | 0.00 |
| local | 0 | 0 | 0.00 |
| ramp | 0 | 0 | 0.00 |
| Total | 15,123,242 | 15,123 | 16.67 |
| Global emissions rate (gm/VMT) | 0.039252457 | | |

Hot Spot Analysis Summary Results

Project Identification:

I- 55 STEVENSON EXPY FROM WEBER RD (WILL/BOLINGBROOK) TO I- 80
(WILL/CHANNAHON) - TIP ID 12-97-0027

EMME/2 scenario:

EMME/2 Module: 3.14 Date: 03-08-22 07:31 User: E170/CATS.....kww
Project: c03 conformity (from 2004-09 TIP Conformity)

Page:80090

Mobile6 input

File
Year
I&M

PM20J-M

2020

PM 2.5 rates are same for I/M & non-I/M

Diesel VMT factors

| | expressway | arterial | local | ramp |
|-------------------------|------------|----------|--------|--------|
| Baseline percent gas | 88.56% | 95.16% | 97.34% | 92.40% |
| Baseline percent diesel | 11.44% | 4.84% | 2.66% | 7.60% |
| Project percent gas | 83.00% | 0.00% | 0.00% | 0.00% |
| Project percent diesel | 17.00% | 0.00% | 0.00% | 0.00% |

VMT consistency check

| source | value | % of baseline |
|-----------------------------|-------------|---------------|
| EMME/2 grand total: | 197,626,067 | 100.0000% |
| Total at 28-vehicle split | 197,626,069 | 100.0000% |
| Implementer VMT (daily): | 1,204,750 | 100.0000% |
| VMT after diesel adjustment | 1,204,750 | 100.0000% |
| Annual Total Project VMT: | 423,870,181 | n/a |

Total Emissions

| Facility | Fine Particulate Matter (annual) | | |
|--------------------------------|----------------------------------|-----------|-------------|
| | Grams | Kilograms | Tons |
| freeway | 7,753,955 | 7,754 | 8.55 |
| arterial | 0 | 0 | 0.00 |
| local | 0 | 0 | 0.00 |
| ramp | 0 | 0 | 0.00 |
| Total | 7,753,955 | 7,754 | 8.55 |
| Global emissions rate (gm/VMT) | 0.018293231 | | |

Hot Spot Analysis Summary Results

Project Identification: I- 55 STEVENSON EXPY FROM WEBER RD (WILL/BOLINGBROOK) TO I- 80 (WILL/CHANNAHON) - TIP ID 12-97-0027

EMME/2 scenario: EMME/2 Module: 3.14 Date: 03-08-25 14:23 User: E170/CATS.....kww Page:84332
Project: c03 conformity (from 2004-09 TIP Conformity)

Mobile6 input

File PM30J-M
Year 2030
I&M PM 2.5 rates are same for I/M & non-I/M

Diesel VMT factors

| | expressway | arterial | local | ramp |
|-------------------------|------------|----------|--------|--------|
| Baseline percent gas | 88.48% | 95.22% | 97.37% | 92.27% |
| Baseline percent diesel | 11.52% | 4.78% | 2.63% | 7.73% |
| Project percent gas | 83.00% | 0.00% | 0.00% | 0.00% |
| Project percent diesel | 17.00% | 0.00% | 0.00% | 0.00% |

VMT consistency check

| source | value | % of baseline |
|-----------------------------|-------------|---------------|
| EMME/2 grand total: | 212,741,703 | 100.0000% |
| Total at 28-vehicle split | 212,741,691 | 100.0000% |
| Implementer VMT (daily) | 1,296,250 | 100.0000% |
| VMT after diesel adjustment | 1,296,250 | 100.0000% |
| Annual Total Project VMT: | 454,846,205 | n/a |

Total Emissions

| Facility | Fine Particulate Matter (annual) | | |
|--------------------------------|----------------------------------|-----------|------|
| | Grams | Kilograms | Tons |
| freeway | 7,253,240 | 7,253 | 8.00 |
| arterial | 0 | 0 | 0.00 |
| local | 0 | 0 | 0.00 |
| ramp | 0 | 0 | 0.00 |
| Total | 7,253,240 | 7,253 | 8.00 |
| Global emissions rate (gm/VMT) | 0.015946576 | | |